UV200RS/V200RS SERIES

Spectrophotometers

Model

UV-200-RS
V-200-RS

USER'S MANUAL

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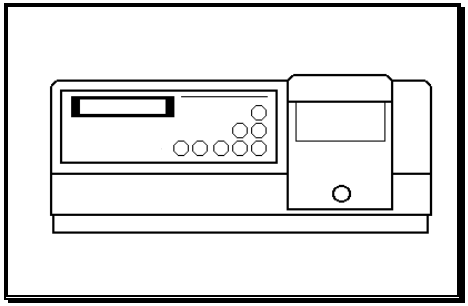


INTRODUCTION

Thank you for your purchase of analytical instrument.

The 200 series spectrophotometers are single beam system. The instruments are compact, lightweight, easy-to-use, value, and ruggedness. A sleek, new design houses, up-to-date electronics and the latest optical components for improved performance, capabilities. 2-line, 20- character liquid crystal display readout displays data and gives easily understood. Large sample compartment accepts from 5mm to 100mm pathlength cuvette and various accessories. Th built-in RS-232 serial interface enables the instrument to be connected to a computer or printer. Windows® 98 based application software is available for 200 series spectrophotometer.

The new 200 series Spectrophotometers are available in two models, an instrument which cover the Ultraviolet and Visible wavelength range from 200 -1000nm, and an instrument which cover the Visible wavelength range from 320 -1000nm. The nominal 5nm spectral bandpass are constant over the entire wavelength range.

The 200 series Spectrophotometers are ideal for use in a clinical laboratory, biochemistry laboratory, petrochemistry laboratory, environmental protection and various fields of quality control.

This user′s manual provides information of 200 series of spectrophotometers, a list of main specifications, and available accessories.

After carefully unpacking the content, check the materials against the packing list to ensure that you have received everything in good condition. If you find part is missing damaged or any other defect, contact MRC sales representative immediately.

However, to keep pace with technological advance, the specifications and operating instructions may be modified or changed as needed. MRC reserves the right to make design modification and changes.

SPECIFICATIONS

Table 1

Model	V-200-RS	UV-200-RS
Optical System	Littrow type, single beam, grating system 1200line/mm	
Spectral Siltwidth	4 nm	5nm
Wavelength Range	320-1000 nm	200-1000 nm
Wavelength Accuracy	±2 nm	
Repeatability	1nm	
Stray Radiant Energy	≤ 0.1%T@340nm	≤ 0.5%T@220nm and340nm
Photometric Range	0%T to 125.0%T, 0A to 2.5A, 0C to 1999C(0-1999F)	
Stability	±0.002A/hr	
Photometric Accuracy	±0.008A@0.5A	±0.004A@0.5A
Power Requirement	115/230volt,±10%,60/50Hz adjustable	
Size:(mm)	465(18.3')W×365(14.3')D×175(6.9')H	
Weight	8.5kg	11.5kg
Standard	Instruction manual, Dust cover, 10×10×45mm rectangular cell, %T/A/C application software for WIN 9X	

UNPACKING INSTRUCTIONS

Carefully unpack the contents and check the materials against following packing list to ensure that you have received everything in good condition.

Packing List for 200 Series Spectrophotometer

Table 2

Description	Quantity
Spectrophotometer	1 set
Square Cuvettes	1 box (pk of 4)
Dust cover	1pc
User's manual	1 book

Place the instruments in suitable location. In order to have the best performance from your instrument. Keep it as far as possible from any strong magnetic or electric fields, or any electrical device that may generate high frequency fields. Set the unit up in an area that is free of dust, corrosive gases, and strong vibration.

Remove any obstructions or materials that could hinder the flow of air under and around the instrument vibration.

Plug the power cord into an outlet. Turn on the instrument and allow it to warm up for 15 minutes before taking any readings.

You spectrophotometer is now ready for operation.

SELECT LIGHT SOURCE(for UV only)

This function is only used for UV-200-RS spectrophotometer. You may use the FUNC key to selecting an available lamp for great measuring depend you samples. The light sources can be exchange between 325nm to 355nm.

. Press the FUNC key until display shows LAMP EXCHANGE? 340nm.

. Press "π"or "θ"key for setting the wavelength point of light source exchanging.

. Press ENT key to store the parameter to be entered.

TURN ON/OFF THE LAMP

The lamps of UV-200-RS spectrophotometer may turn on or off the lamp if needed.

. Press the FUNC until display shows W lamp on? (W lamp off?), or D2 lamp on? (D2 lamp off?), then press the ENT key to turn on or off the lamps.

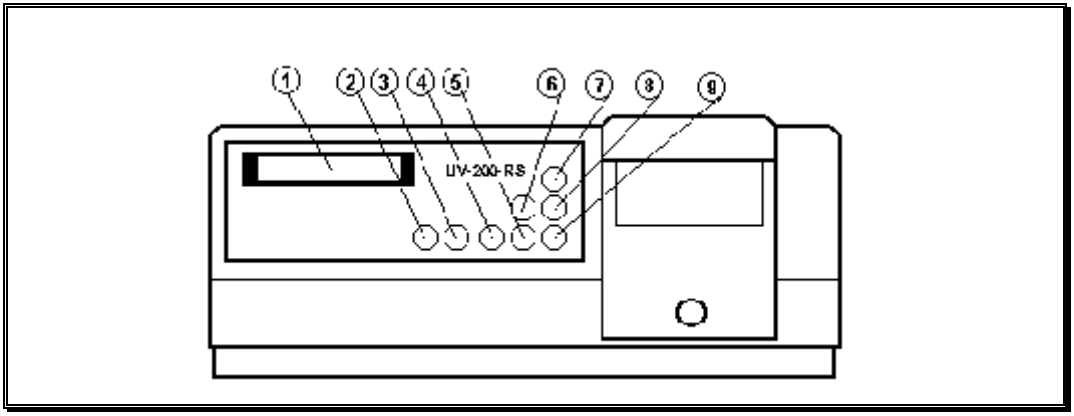
CONNECT INSTRUMENTS TO PC

The 200 series spectrophotometers has been built-in RS-232C interface, it enables you to connect a personal computer and use PC running Windows® 98 to operate your spectrophotometer.

. Press the FUNC key until display shows CONNECT PC ? then press the ENT key.

When the instrument is connecting to the PC, the display is showing CONNECTING PC .
When the instrument is connected to the PC, the display is showing PC CONNECTED .
When the instrument is not connected to PC, the display is showing CONNECT PC ?.

OPERATING FEATURES



1 . DIGITAL READOUT . displays the data of Transmittance, Absorbance, Concentration.

2, 3 . WAVELENGTH SELECTOT KEYS used to select the desired analytical wavelength,

and used to select the special functions as setting the parameter of standard concentration (concentration value or factor), light source exchange selection, Lamp ON/OFF etc.

4. FUNCTION SELECTOR select the functions as setting the parameter of standard concentration (concentration value or factor), light source exchange selection, Lamp ON/OFF etc.

5. ENTER KEY is used to entering the parameter of sample to the memory or confirming the function that is selected.

6.100%T/0A CONTROL is used to set the display to 100%T or 0Abs. It must be reset whenever the analytical wavelength has been changed.

7. MODE SELECTOR selects the Transmittance, Absorbance, Concentration mode.

8. 0%T CONTROL is used to set the display to 0%T before setting 0Abs.

9. CLEAN KEY is used for cleaning the wrong parameter.

OPERATING PROCEDURES

1-➲. Plug the instrument into a grounded outlet.

2-U. Turn the instrument on. Allow the instrument to warm up for at least 20 minutes.

3-U. Set to desired wavelength with the WAVELENGTH UP and DOWN ARROWS.

4-U. Select the desired operating mode as TRANSMITTANCE, ABSORBANCE, or CONCENTRATION when using the MODE key.

5-U. Choose matched cuvettes of appropriate pathlength for analytical method you are using. you have to use the same pathlength cuvette for all blanks, standards and samples.

🔔 **NOTE:** All of cuvettes supplied with your instrument are 10mm pathlength and have been matched. Glass cuvettes are useable above 325nm only. Quartz cuvettes must be used below 325nm.

6-U. Fill one of the matched cuvettes with a blank solution and place in position one of the cuvette holder. The other positions with sample solutions to be measured.

🔔**Note:** Solution must be at least 20 mm high in a standard square cuvette.

7-Ʊ. Close the sample compartment cover, put the blank solution into the light path, set 100%T or 0Abs by pressing the 0Abs/100%T KEY until display reads “100.0%T”or 0.000A.
8-Ʊ. You may then index the cuvette holder by pulling the cuvette selector arm into the next position and reading the %T or Abs value of the samples.

CONCERTRATION MODE

Note: This mode is used only if the linearity of the standard curve has been verified.

-- Using in C/Standard mode:

9-Ʊ. -- Press MODE selector key until the [Abs] is displayed.

10-Ʊ. -- Place the blank solution in the sample compartment, then close the sample compartment cover.

11-Ʊ. -- Press the [100%T/0A] control key to zero the blank solution.

12-Ʊ. -- Remove the blank solution from the sample compartment cover.

13-Ʊ. -- Press the [FUNC] selector key until the the [STD/CONC=1999] is lit.

14-Ʊ.-- Using the “π”or “θ”key to setting the concentration of the standard on the digital display, then press the [ENT] key.

15-0. -- Insert the sample solution to be measured into the cuvette holder. Close the sample compartment cover, read results directly in concentration units on the digital display.

- Using in C/Factor mode:

9-0. -- Press [MODE] selector key until the LED under the [Abs] is lit.

10-0. -- Place the blank solution in the sample compartment, then close the sample compartment cover.

11-0. -- Press the [100%T/0A] control key to zero the blank solution.

12-0. -- Remove the blank solution from the sample compartment.

13-0. -- Press the [MODE] selector key until the [**STD/FACTOR=1999**] is lit.

14-0. -- Using the "π"or "θ"key to setting the factor of the standard on the digital display, then press the [ENT] key.

15-0. -- Insert the sample solution to be measured into the cuvette holder. Close the sample compartment cover, read results directly in concentration units on the digital display.

MAINTENANCE:

This spectrophotometer has been designed to be durable and reliable and reliable. Therefore, the routine maintenance of the instrument is minimal.

However, you will need to replace the lamp or you may want check the wavelength calibration and photometric linearity to verify the instruments's pweformance.

Warning

The manufacturer recommends only authorized service representatives perform procedures requiring removal of the instrument's cover and replacement of electrical component's. To protecting both of yourself and your instrument., be sure to contact MRC authorized service representative to perform any service procedure you do not feel comfortable performing.

TO REPLAC HALOGEN BULB

1. -- Turn off the power and unplug the instrument.

2. -- Remove the two screws on the back side of the instruments.

3. -- Remover the lamp from lamp holder

4. -- Carefully replace the new lamp.

Note: Do not handle Halogen lamp with bare fingers. Use a piece of tissue or cloth when handling the lamp. The oil from your fingers can cause the lamp to burn out prematurely!

WAVELENGTH CALIBRATION:

As usual the 200 series spectrophotometer retains its wavelength calibration indefinitely. However if the instrument receives a severe shock or is abused,

use the following methods to check the wavelength calibration.

In the Didymium filter method, the filter has two special absorbance peak at the 529 nm and the 808nm, when the instrument is calibrated properly, you will find minimum Transmittance (maximum absorbance) at the range of 529nm (or 808nm) ±2nm.
Note that the specific transmittance values are not important, you are only looking for the wavelength where minimum transmittance (maximum absorbance) occurs.

1. -- Turn on your instrument and allow it to warm up for 20 minutes.

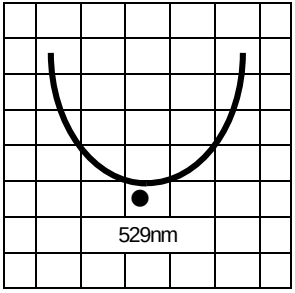
2. -- Select the %Transmittance operating mode by press the MODE key.

3. -- Set the wavelength to 519nm.

4. -- Insert the cuvette filled with distilled water in the well of the cuvette holder.

5. -- Pressing the 0Abs/100%T Key until display reads 100.0%T or 0.000A, then remove the cuvette with water.

6. -- Insert the didymium filter in the well of the cuvette holder, record the %T reading on the digital display. Check the wavelength calibration with Didymium Filter



7. -- Repeat steps **3.** through **6.** to measure separately the wavelength of the point between 519nm and 539nm.

8. -- Looking for the minimum %Transmittance along this record, the minimum %Transmittance should be obtained between 526nm and 532nm. The wavelength accuracy of the SP-2100 series spectrophotometers is ±2nm

TROUBLESHOOTING:

Problem	What to do
Display shows "1XX.X" in %transmittance mode and shows a negative reading in absorbance mode.	1. Check the sample compartment lid is closed or not, make sure that the lid is closed. 2. Make sure that the sample compartment is empty and the light door is shut. 3. Adjust the sensitivity switch to low position. 4. Turn 100%T/A knob until display is on scale.
Display shows "000.0" in %T mode or "1.XXX" in absorbance mode(where XX" are two blank digitals.)	1. Check the bulb, if it is not lit, replace the bulb. 2. Check whether or not tube is inserted the sample compartment, if not, insert it. Note: there is a light door is built in the front of the sample compartment. To set full scale, you have the insert the tube with blank solution. 2. Check whether or not light affects the reading: ❶ Open the lid of sample compartment, make sure nothing block in the light path. ❷Check the light door with a tube, if you cannot insert tube into sample compartment. perhaps the door is blocked, clean and remove anything in it.

	❸Check the display to see if it changes when you open and close the lid. If the display doesn't change, Either the detector or the main PC board needs to be replaced. ❹If the display does change, check the light beam with the following steps: ❁ Set the wavelength to 580nm. ❁ Place a test tube with a long strip of white paper into sample compartment. you should see a yellowish light from the bottom of the paper, coming from the right sight of the sample compartment. ❁ If you don't see any light at all, the internal optical path is blacked in some way. ❁ if you see light, check that cable from the detector to the main PC board is connected. - Replace detector assembly. - Replace main PC board.
Nothing at all appears on the display	1 Check the power indicative lamp, if it is not lit, -Power cable not plugged. -Power switch on unit is off or defective. -Power cable is defective. -Fuse is blown. is located inside in the bottom of the instrument. 2. Main PC board is defective. 3. Internal power transformer is defective. 4. Internal wiring connections are bad.

No difference in the readings on the display when changing between Abs. and %Trans mode makes.	1. Internal connection between the mode switch and the main PC board is bad. 2. Mode switch is defective. 3. Main PC board is defective.
No difference in the readings on the display when changing sensitivity switch between high and low positions.	1. Internal connection between the sensitivity switch and the main PC board is bad. 2. Sensitivity switch is defective. 3. Main PC board is defective.
Bulb is lit, but no display at all.	1. Internal connection between the digital display meter and the main PC board. 2. Main PC board is defective. 3. Digital display meter is defective.
Readings differ greatly from expected results.	1. Check wavelength calibration. 2. Check your application, procedure, and sampling technique.
Display not zero, but does display some value.	1. Bad internal connection between the resistor of the 0%T control knob and main PC board. 2. Detector is dirty or defective. 3. Sample compartment is not securely seated in the instrument. 4. Main PC board is defective. 5. Digital display is defective.
Readings drift.	1. Check your application, procedure and sampling

	technique. 2. Fumes from sample are affecting the optics of the instrument. 3. Power in the line is fluctuating or instrument. 4. Instrument is not grounded properly. 5. Line voltage is incorrect. 6. Bulb is defective. 7. Detector is defective. 8. Main PC board is defective.
Readings are not repeatable.	1.Check that the wavelength and 100%T are set correctly. 2. Is there any bubbles and degassing in your sample. 3. make sure that test tube is clean. 4. Tubes are not aligned in exactly the same position for each reading. 5. Sample compartment is not securely seated in the instrument. 6. Cuvette holder is not securely seated in the adapter. 7. Diameter of tube may be too small for a snug fit the sample compartment.

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